

Additional questions chapter 9

1.

Elmer Kink's utility function is $\min\{x_1, 2x_2\}$.

Draw a few indifference curves for Elmer.

Find each of the following for Elmer:

- His Marshallian demand function for each good.
- His Indirect utility function.
- His Hicksian demand function for each good.
- His Expenditure function.
- Verify that Roy's Law applies in Elmer's case.

2.

The n -good Cobb-Douglas utility function is

$$u(\mathbf{x}) = A \prod_{i=1}^n x_i^{\alpha_i},$$

where $A > 0$ and $\sum_{i=1}^n \alpha_i = 1$.

- Derive the Marshallian demand functions.
- Derive the indirect utility function.
- Compute the expenditure function.
- Compute the Hicksian demands.

3.

The Stone-Geary utility function has the form

$$u(\mathbf{x}) = \prod_{i=1}^n (x_i - a_i)^{b_i},$$

where $b_i \geq 0$ and $\sum_{i=1}^n b_i = 1$. The $a_i \geq 0$ are often interpreted as "subsistence" levels of the respective commodities.

- Derive the associated expenditure and indirect utility functions. Note that the former is *linear* in utility, whereas the latter is proportional to the amount of "discretionary income," $y - \sum_{i=1}^n p_i a_i$.
- Show that b_i measures the share of this "discretionary income" that will be spent on "discretionary" purchases of good x_i in excess of the subsistence level a_i .